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Technology for disabled and older people: what have we achieved, where are we going?

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Abstract

Research on technology for disabled and older people has expanded considerably in the past 25 years. This meeting will critically review that research and the role human computer interaction has played in it. It will then consider how human computer interaction research can positively contribute to the further development of the area and what directions research can most usefully follow.

Author Keywords

Disabled and older people, accessibility, assistive technology, universal design, design for all

ACM Classification Keywords

K.4.2. [Computers and Society]: Social Issues – Assistive Technologies for Persons with Disabilities.
H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Introduction

Research on technology for disabled and older people have developed in the last 25 years from a very specialist topic to one included in mainstream concerns. For example, at the CHI Conference in 1995 there were 8 activities on technology for disabled and older people, comprising two long papers, two short papers, one

panel discussion, one interactive experience and one video and a tutorial. Interestingly, apart from the tutorial and the panel discussion, all these activities were about technology for people with visual impairments. The tutorial was about “enabling technology for users with special needs [2] and the panel sessions was about user interfaces overall the lifespan, including those for children and older people [1]. Whereas at the CHI Conference in 2015 there were 42 activities, comprising six dedicated sessions of 24 papers (although putting the papers related to disabled and older people in dedicated sessions may be a form of “ghettoization”), 6 papers in other sessions, six Work-in-Progress papers, one course and one Interactivity demonstration. The range of topics covered has also expanded to include technology for people with aphasia, autism and motor disabilities, although technology for people with visual impairments still features prominently. However, it does need to be remembered that in this period the CHI conference has grown considerably: in 1995 there were 66 papers accepted, whereas in 2015 there were 486 papers accepted.

The topic of technology and disabled and older people can be thought of in terms of two main themes [4]. On the one hand we have research which attempts to ensure that current and emerging technologies are accessible for disabled and older people; this ranges from the Web to automatic banking machines (ATMs) to smartphones. It would be preferable if all new technologies were designed with principles of universal design (often known as “design for all” in Europe), but unfortunately we are usually trying to retro-fit accessibility into technologies, which is not only more

expensive but probably results in less effective solutions.

On the other hand we have research on using technology, particularly emerging technologies, to support disabled and older people in the problems they encounter in life. This includes the development of systems very specifically for a disabled or older user group, such as refreshable braille displays for blind computer users or fall alarms for older people living independently. These are often called assistive technologies. Sometimes, technologies developed for disabled or older people then cross over into the mainstream, and become technologies for everyone. For example, the predictive text features that are now very widely used on mobile phones, were first developed to assist people with speaking difficulties who use text-to-speech devices to communicate [3].

But assistive technologies also include the adaptation of emerging mainstream technologies adapted for the particular problems faced by disabled and older people. For example, with the emergence of navigation systems based on the Global Position System (GPS) in the early 1990s, similar systems were developed for blind pedestrians, for example the Trekker device.

What have we achieved

A recent review of research on technology for disabled and older people found a vibrant research area with a very wide range of topics. A preliminary analysis of 834 papers [5] attempted to group research into areas of which people were being assisted and what kinds of support is being offered, rather by the technology being used. It found that technology for older people was the

most commonly researched area (35.5%/296 papers), followed by technology for people with visual disabilities (25.1%/209 papers) and then research covering more than one disabled/older user group (12.9%/108 papers).

In terms of what kinds of support are being researched, a preliminary analysis of 362 papers found that research on how people can interact with technology was the most common (17.4%/63 papers), which included topics such as new or adapted input and output devices and interaction techniques. This was closely followed by research on the accessibility and use of the Web (16.3%/59 papers) and technologies to support tasks of daily living (13.8%/50 papers) such as banking, cooking, and memory support).

Where are we going? Themes for the SIG Meeting

The aim of the meeting will be to firstly critically discuss the achievements in the developments of technology for disabled and older people in the past years and how human computer interaction research has contributed to those achievements.

Secondly, the meeting will consider important topics to develop on how human computer interaction research can positively influence the development of technology for disabled and older people in the future and what directions this research might take. Topics to be discussed might include, but are not limited to:

- Adaptation of usability methods appropriately to the needs of disabled and older participants
- Service quality of systems for collaborative accessibility

- An inclusive infrastructure for industrialized countries and developing markets
- Mid-term to long-term activities in an ageing society involving interaction among multiple stakeholders
- Education: including the needs of disabled and older users and inclusive design principles in HCI curricula

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